Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
PA1752WO		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/FR2004/001525	18.06.2004	01.07.2003

International Patent Classification (IPC) or national classification and IPC

H01M8/04, H01M8/10, H01M4/88

Applicant

COMMISSARIAT A L'ENERGIE ATOMIQUE

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FR2004/001525

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-11 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-14 received by this Authority on 04.08.2005 with letter of 01.08.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets 1/6-6/6 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FR2004/001525

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following document:

D1: EP-A-1 258 937 (ST MICROELECTRONICS SRL) 20 November 2002 (2002-11-20)

Novelty

No prior art document describes a fuel cell wherein a substrate has a cavity formed within it and comprises a plurality of studs supporting the electrolytic membrane. The same applies to the method for producing the cavity in the substrate, according to which studs are formed simultaneously or by electrolytic growth.

The subject matter of claims 1, 11 and 14 is therefore novel (PCT Article 33(2)).

Inventive step

D1, which is considered to be the prior art closest to the subject matter of claim 1, describes (the references between parentheses apply to said document): a fuel cell including parallel channels (7 and 8) that are not mutually linked, defined by walls for supplying gaseous reagents.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Consequently, the subject matter of claim 1 differs from D1 in that no mention is made in the latter of the cavity formed in the substrate and the plurality of studs provided therein for supporting the electrolytic membrane.

The problem that the present invention is intended to solve can therefore be considered to be that of effectively and rapidly discharging the compounds formed during operation of the fuel cell and rapidly renewing the reagent fluids.

The solution to this problem, as proposed in claim 1 of the present application, is considered to involve an inventive step (PCT Article 33(3)) on the grounds that it is not obvious for a person skilled in the art, taking D1 as the starting point, to form a cavity in the substrate comprising studs supporting the electrolytic membrane and thereby arrive at the present invention, since it is neither suggested in the prior art nor even widespread knowledge. The same reasoning applies to the manufacturing method claimed in claims 11 and 14, since D1 describes producing channels by etching them electrochemically or chemically into the silicon substrate and not forming the cavity and studs simultaneously or by electrolytic growth.

Claims 2 to 10 are dependent on claim 1, claims 12 and 13 are dependent on claim 11; said dependent claims thus also comply, as such, with the PCT requirements of novelty and inventive step.